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CTE Standards Unpacking
Residential Construction

Course: Residential Construction
Course Description: Students will gain in depth knowledge of residential construction by identifying and demonstrating correct safety procedures, construction math, blueprint reading and basic surveying techniques. The student will also be able to identify building products, and safely and correctly use various hand/power/pneumatic tools. Concrete construction applications and construction of a residential house will be the main thrust of this course. The student will be able to frame floor, wall and ceiling/roof systems. Once the framing is complete the student will install windows and doors, apply thermal and moisture protection, apply exterior sheathing along with exterior siding and roofing material. Interior work will be performed by installing drywall, installing cabinets and conducting interior finish work. The concept of stair layout and construction will be incorporated in this class. Basic residential electrical and plumbing will be performed as it relates to the necessary requirements in the building process. The National Center for Construction Education & Research (NCCER) competencies/objectives are followed as a resource.
Career Cluster: Architecture & Construction
Prerequisites: Introduction to Architecture and Construction; Building Trades
Program of Study Application: This is the fourth course in the suggested sequence of the Residential Construction Program of Study. It is recommended that it is preceded by (1) Foundation Courses, (2) Introduction to Architecture and Construction, and (3) Building Trades; and followed by (5) Capstone Experience.

INDICATOR #RC 1: **Understand and apply industry safety procedures**		
SUB-INDICATOR 1.1 (Webb Level: 1 Recall): Demonstrate proper industry safety standards.		
Knowledge (Factual): Occupational Safety and Health Administration (OSHA) 10 Safety Data Sheets (SDS) General shop safety Lockout/tag out procedures Basic first aid Protective clothing and safety equipment	**Understand (Conceptual):** Value of OSHA 10 requirements Importance of OSHA to employers Importance of lockout/tag out procedures	**Skills (Application):** Demonstrate general shop safety Demonstrate lockout/tag out procedures Demonstrate first aid Maintain a written portfolio record of written safety examinations and equipment examinations which the student has passed

Safe work procedures around electrical hazards		

Benchmarks

Students will be assessed on their *ability* to:

- Examine basic construction safety using Occupational Safety Health Administration (OSHA) standards or equivalents.
- Demonstrate the use of protective clothing and safety equipment
- Inspect and care for various types of personal protective equipment
- Demonstrate basic first aid
- Explain the function of Material Safety Data Sheets (MSDS)
- Practice safe work procedures around electrical hazards
- Explain and practice safe lockout/tag out procedures
- Maintain a written portfolio record of written safety examinations and equipment examinations which the student has passed

Academic Connections

ELA Literacy and/or Math Standard (if applicable, Science and/or Social Studies Standard):	**Sample Performance Task Aligned to the Academic Standard(s):**
RI4.Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze how an author uses and refines the meaning of a key term or terms over the course of a text RI7.Integrate and evaluate multiple sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a question or solve a problem.	Students will explain orally or in writing the safe lockout/tag out procedures.

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INDICATOR #RC 2: **Utilize appropriate industry math skills and formulas**

SUB-INDICATOR 2.1 (Webb Level: 3 Strategic Thinking): Understand and demonstrate basic math skills.

Knowledge (Factual):	**Understand (Conceptual):**	**Skills (Application):**
Measurement tools Whole numbers Fractions Decimals Percent Unit of measure for a building project Board feet	The importance of converting fraction, decimals, and percent's The relationship of square/cubic inches to square/cubic feet and square/cubic feet to square/cubic yards Recognize the difference between linear and board feet	Read a tape measure Apply mathematical applications of and conversion of whole numbers, fractions, decimals, and percent Convert linear feet to board feet Calculate the necessary unit of measure for a building project Recognize some of the basic shapes used in the construction industry and apply basic geometry to measure them.

Benchmarks

Students will be assessed on their *ability* to:

- Correctly read a tape measure to the nearest 1/16"
- Add, subtract, multiply, and divide whole numbers, fractions, decimals, and percent with and without a calculator
- Convert decimals to percent and percent to decimals
- Convert fractions to decimals and decimals to fractions
- Calculate the necessary unit of measure for a building project (examples: square inches/square feet, cubic inches/cubic feet)
- Convert linear feet to board feet

Academic Connections	
ELA Literacy and/or Math Standard (if applicable, Science and/or Social Studies Standard): G-MG.1 – Use geometric shapes, their measures, and their properties to describe objects. G-MG.2 – Apply concepts of density based on area and volume in modeling situation.	**Sample Performance Task Aligned to the Academic Standard(s):** Students will be able to calculate the amount of drywall to cover an 8x10 wall.

INDICATOR #RC 3: **Understand concepts of blueprint reading and perform basic survey techniques**		
SUB-INDICATOR 3.1 (Webb Level: 2 Skill/Concept): Demonstrate how to read blueprints.		
SUB-INDICATOR 3.2 (Webb Level: 3 Strategic Thinking): *Demonstrate survey techniques and site layout.*		
Knowledge (Factual): Basic blueprint terms and symbols Plot plan, building lines, survey equipment instruments, layout and running lines Architectural symbols Materials used Written specifications Electrical and plumbing symbols	**Understand (Conceptual):** Different classifications of construction drawings Importance of building codes in construction Importance of squaring a building	**Skills (Application):** Read and understand blueprint terms, symbols, and schedules Use a transit/level to find an elevation Interpret and use drawing dimensions Identify selected architectural symbols commonly used to represent material on plans

Quantity takeoff for materials Site layout		Identify selected electrical, mechanical, and plumbing symbols commonly used on plans Read and interpret written specifications, section and detail drawings Demonstrate or describe how to perform a quantity takeoff for materials Use taping and/or chaining equipment and procedures to make distance measurements and perform site layout tasks

Benchmarks
Students will be assessed on their *ability* to:

- Identify and recognize basic blueprint terms and symbols
- Relate information on prints to real parts and locations
- Define plot plan, building lines, care of instruments, layout and running lines
- Demonstrate surveying a project

Academic Connections

ELA Literacy and/or Math Standard (if applicable, Science and/or Social Studies Standard):	**Sample Performance Task Aligned to the Academic Standard(s):**
G -CO.2 Represent transformations in the plane using, e.g., transparencies and geometry software; describe transformations as functions that take points in the plane as inputs and give other points as outputs. Compare transformations that preserve distance and angle to those that do not (e.g., translation versus horizontal stretch). G-CO.4 Develop definitions of rotations,	Square activity: Define areas of different floor plans Shape activity: Find surface areas of three dimensional figures. Activity: Use coordinate points to find dimensions, perimeter, and surface area Students will measure lengths of shadows to find heights of objects by

reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments. G-CO.5 Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using, e.g., graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another. G-CO.6 Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to decide if they are congruent. G-CO.7 Use the definition of congruence in terms of rigid motions to show that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are G.SRT.6 Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles. G.SRT.7 Explain and use the relationship between the sine and cosine of complementary angles.	using similar triangles and proportions. Similar triangle activity to find ratios of opp/hyp, adj/hyp, opp/adj. Compare answers with other groups. Students will use trigonometric ratios and the Pythagorean Theorem to indirectly measure tall objects and to find changes in elevation and slope. Surveying Activities: Students will use trigonometry (including the Law of Sines and the Law of Cosines) to find unknown measurements in triangles. This will include calculating the area of triangles. ($A = 1/2\ ab\ \sin(C)$) Pythagorean Rope Activity to discover 3/4/5 right triangles. Students will use the Pythagorean theorem to determine the placement of the bottom sill plate. Laser level Activity: Using laser level students will find the volume of dirt that needs to be removed from a hillside to put in a basement Students will find and use slope and length to fit an ADA certified ramp to go into a home based on existing elevations.

INDICATOR #RC 4: **Identify and understand wood building materials, fasteners, and adhesives**		
SUB-INDICATOR 4.1 (Webb Level: 1 Recall): Understand and demonstrate the use of wood building materials.		
SUB-INDICATOR 4.2 (Webb Level: 1 Recall): Understand and demonstrate the use of fasteners and adhesives.		
Knowledge (Factual):	**Understand (Conceptual):**	**Skills (Application):**

Terms used in wood and lumber Imperfections found in lumber Lumber and plywood grades Engineered lumber Fastener types and styles	Differences between treated and non-treated lumber Application for wood I-beams	Recognize different dimensions of construction materials Identify different grades of lumber and plywood and uses for each Identify different fastener types and sizes List advantages of glulam lumber (laminated beams) over conventional lumber

Benchmarks

Students will be assessed on their *ability* to:

- Explain terms commonly used in building materials
- Identify the use of engineered lumber
- Demonstrate the proper use of fasteners and adhesives
- Compare and contrast the different dimensional lumber sizes

Academic Connections

ELA Literacy and/or Math Standard (if applicable, Science and/or Social Studies Standard):	**Sample Performance Task Aligned to the Academic Standard(s):**
RI4. – Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze how an author uses and refines the meaning of a key term or terms over the course of a text. SL4. Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose and audience.	Students will explain orally common terminology used in building materials.

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INDICATOR #RC 5: **Identify and correctly use appropriate hand, power and pneumatic tools**		
SUB-INDICATOR 5.1 (Webb Level: 2 Skill/Concept): Demonstrate safe and proper use of hand tools.		
SUB-INDICATOR 5.2 (Webb Level: 2 Skill/Concept): Demonstrate safe and proper use of power tools.		
SUB-INDICATOR 5.3 (Webb Level: 2 Skill/Concept): Demonstrate safe and proper use of pneumatic tools.		
Knowledge (Factual): Hand, power, and pneumatic tools used in the construction trades Basic maintenance procedures of hand, power, and pneumatic tools used in the construction trades	**Understand (Conceptual):** Importance of proper operation of instruction tools Ramifications of improper and unsafe use of tools	**Skills (Application):** Visually inspect tools for safety hazards. Demonstrate safe and effective use of tools Demonstrate basic maintenance and storage of tools

Benchmarks

Students will be assessed on their *ability* to:

- Identify and report on the tools used in the construction trades
- Demonstrate safe use and proper application of tools
- Explain and demonstrate basic maintenance procedures of tools

Academic Connections

ELA Literacy and/or Math Standard (if applicable, Science and/or Social Studies Standard):	**Sample Performance Task Aligned to the Academic Standard(s):**
SL4. Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose and audience.	Students will explain orally the basic maintenance procedures of tools.

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INDICATOR #RC 6: **Integrate concrete technology to achieve thorough construction background**		
SUB-INDICATOR 6.1 (Webb Level: 3 Strategic Thinking): Understand and demonstrate the uses of concrete and reinforcing materials.		
Knowledge (Factual): Tools Slump Concrete materials Ratios Cubic yard Estimating	**Understand (Conceptual):** Characteristics of concrete Concrete construction process Importance of safety requirements in concrete applications Importance of reinforcement bars Finishing and curing processes Importance of safety precautions using concrete forms	**Skills (Application):** Explain the importance of a screed List the four types of footing (continuous or spread, stepped, pier, and grade beam) Perform volume estimates Describe basic site layout using levels and measuring tools

Benchmarks

Students will be assessed on their *ability* to:

- Perform and pass a concrete activity test
- Calculate the volume of concrete needed for a given job (cubic yards)
- Use Pythagorean Theorem to square forms

Academic Connections

ELA Literacy and/or Math Standard (if applicable, Science and/or Social Studies Standard):	**Sample Performance Task Aligned to the Academic Standard(s):**
G-GMD.3 Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.	Using blueprints of a cabin, students will find the surface area and volume of the cabin.
G-GMD.4 Identify the shapes of two-dimensional cross-sections of three	Students will discover how the volume changes as 3D figures are enlarged/shrunk.

dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects. Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder).	Students will measure and calculate the volume and surface area of 3D shapes including prisms, cylinders, pyramids, cones, and spheres. Students will find probabilities of a single event Calculate volume and of silos, grain bins, other buildings, and the amount of dirt needing to be removed from a site for a basement

INDICATOR #RC 7: **Understand and perform framing of flooring, wall, ceiling and roofing systems**		
SUB-INDICATOR 7.1 (Webb Level: 2 Skill/Concept): Understand and demonstrate framing of flooring systems.		
SUB-INDICATOR 7.2 (Webb Level: 3 Strategic Thinking): Understand and demonstrate framing of wall and ceiling systems.		
SUB-INDICATOR 7.3 (Webb Level: 3 Strategic Thinking): Understand and demonstrate framing of a roofing systems.		
Knowledge (Factual): Floor, wall, ceiling, and roof system requirements Building codes Rafter Sheathing American Disabilities Act (ADA)	**Understand (Conceptual):** Different components of framing a house Importance of rough openings/header material	**Skills (Application):** Identify different types of framing systems Identify parts of framing Accurately perform layout procedure of a house Identify different roofing systems Calculate pitch using rise and run Identify various types of sheathing used in

		construction

Benchmarks
Students will be assessed on their *ability* to:

- Demonstrate knowledge of using a framing square or speed square
- Successfully construct the framing of a house including floor, wall, ceiling, and roof system

Academic Connections

ELA Literacy and/or Math Standard (if applicable, Science and/or Social Studies Standard):	**Sample Performance Task Aligned to the Academic Standard(s):**
RI4.Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze how an author uses and refines the meaning of a key term or terms over the course of a text	Students will read blueprints to construct the framing of a house.
RI7.Integrate and evaluate multiple sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a question or solve a problem.	Students will apply the properties of parallel lines and their angles by laying out floor trusses from a 2D blueprint.
G-CO.1 Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc.	Use properties of triangles and quadrilaterals to ensure floor systems are square. Use proportions to build the floor system to proper size. Apply concepts of vertical and horizontal lines when setting floor trusses
G-CO.6 Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to decide if they are congruent.	Students will apply the properties of parallel lines and their angles while building the house walls. Using diameter and radius of circles, students will be able to create an arched doorway.
G-MG.1 Use geometric shapes, their	

measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder).	Triangle Manufacturing Activity: Discover and explain criteria for triangle congruence (ASA, SAS, SSS, HL)

INDICATOR #RC 8: **Understand and demonstrate installation of windows and exterior doors**		
SUB-INDICATOR 8.1 (Webb Level: 2 Skill/Concept): Understand and demonstrate installation of windows.		
SUB-INDICATOR 8.2 (Webb Level: 2 Skill/Concept): Understand and demonstrate installation of exterior doors.		
Knowledge (Factual): Types of doors and windows Jamb widths Thresholds Lock set Building code requirements Parts of a window/door	**Understand (Conceptual):** Proper installation of doors and windows Difference in trim packages	**Skills (Application):** Identify the swing of a door (right hand of left hand) Identify different styles of windows (double hung, single hung, sliding) Demonstrate how to install windows and exterior doors
Benchmarks Students will be assessed on their *ability* to: • Install a pre-hung door and window		
Academic Connections		
ELA Literacy and/or Math Standard (if applicable, Science and/or Social	**Sample Performance Task Aligned to the Academic Standard(s):**	

Studies Standard):	
RI4.Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze how an author uses and refines the meaning of a key term or terms over the course of a text.	Students will read to determine the different styles of windows.
RI7.Integrate and evaluate multiple sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a question or solve a problem. G-CO.11 Prove theorems about parallelograms. *Theorems include: opposite sides are congruent, opposite angles are congruent, the diagonals of a parallelogram bisect each other, and conversely, rectangles are parallelograms with congruent diagonals.* G-SRT.5 Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.	Properties of quadrilaterals will be reviewed to ensure window openings are square. This method will also be used to sheet walls that are on the floor. Trigonometric functions will be used to find proper lengths of diagonals of openings. Students will find compound angles to frame a bay window. Properties of quadrilaterals will be reviewed to ensure squareness of door openings. Trigonometric functions will be used to find proper lengths of diagonals of openings.

INDICATOR #RC 9: **Identify and perform different exterior finishing methods**		
SUB-INDICATOR 9.1 (Webb Level: 2 Skill/Concept): Understand and demonstrate installation of exterior finish.		
Knowledge (Factual): Types of exterior finishes Flashing Cornices Estimating	**Understand (Conceptual):** Importance of flashing Difference between primed and pre-finished siding	**Skills (Application):** Identify the types and parts of common cornices Estimate lap and panel siding

Benchmarks
Students will be assessed on their *ability* to:

- Properly install flashing, cornice, and siding

Academic Connections

ELA Literacy and/or Math Standard (if applicable, Science and/or Social Studies Standard):	**Sample Performance Task Aligned to the Academic Standard(s):**
RI4.Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze how an author uses and refines the meaning of a key term or terms over the course of a text	Students will orally explain the types and parts of common cornices.
RI7.Integrate and evaluate multiple sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a question or solve a problem.	Students will have to demonstrate how to properly find and cut angles for gable ends
SL4. Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose and audience.	Using surface area equations to determine proper amount of exterior wall finish from blueprints
G-SRT.8 Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.	

INDICATOR #RC 10: **Identify and understand different roofing applications**

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SUB-INDICATOR 10.1 (Webb Level: 2 Skill/Concept): Understand and demonstrate installation of roofing materials.		
Knowledge (Factual): Safety requirements Types of roofing materials Flashing	**Understand (Conceptual):** Types of underlayment's (felt, ice and water, flashing) Importance and application of roof vents Proper installation of hips, valleys, and ridges	**Skills (Application):** Differentiate types of shingles Explain how to make various roof projections water tight when using shingles

Benchmarks
Students will be assessed on their *ability* to:

- Properly install underlayment and shingles

Academic Connections	
ELA Literacy and/or Math Standard (if applicable, Science and/or Social Studies Standard):	**Sample Performance Task Aligned to the Academic Standard(s):**
SL4. Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose and audience.	Students will orally explain the different types of shingles.
RI4.Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze how an author uses and refines the meaning of a key term or terms over the course of a text.	Students will find the surface area of a roof and determine the proper amount of material for sheeting and shingles.
RI7.Integrate and evaluate multiple sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in	Students will review the concept of slope.

order to address a question or solve a problem. G-SRT.8 Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems. G-SRT.11 (+) Understand and apply the Law of Sines and the Law of Cosines to find unknown measurements in right and non-right triangles (e.g., surveying problems, resultant forces).	 Determine proper angles of hips and valleys. Students will determine volume of attic space to determine proper amount of vents needed

INDICATOR #RC 11: **Understand the importance of, and properly install, thermal and moisture protection**		
SUB-INDICATOR 11.1 (Webb Level: 2 Skill/Concept): Understand and demonstrate installation of thermal and moisture protection.		
Knowledge (Factual): Requirements of installation Building wrap R-value Vapor barrier	**Understand (Conceptual):** Requirements of moisture control and ventilation Infiltration control requirements	**Skills (Application):** Describe the characteristics of various types of insulating materials Calculate the required amount of insulation
Benchmarks Students will be assessed on their *ability* to: • Properly install insulation, vapor barrier, and building wrap		
Academic Connections		
ELA Literacy and/or Math Standard (if applicable, Science and/or Social	**Sample Performance Task Aligned to the Academic Standard(s):**	

Studies Standard): RI4.Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze how an author uses and refines the meaning of a key term or terms over the course of a text RI7.Integrate and evaluate multiple sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a question or solve a problem. SL4. Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose and audience.	Students will orally describe the characteristics of various types of insulating materials. Find surface area of interior and exterior walls to determine proper amount of material to be used

INDICATOR #RC 12: **Perform drywall installation and finishing techniques**		
SUB-INDICATOR 12.1 (Webb Level: 2 Skill/Concept): Understand and demonstrate drywall installation.		
SUB-INDICATOR 12.2 (Webb Level: 2 Skill/Concept): Understand and demonstrate drywall finishing.		
Knowledge (Factual): Gypsum wallboard Moisture control Taping Finishing and texturing Fasteners Drywall tools	**Understand (Conceptual):** How soundproofing is achieved Purpose of expansion joints Different types of tape Different types of compounds	**Skills (Application):** Identify the different types of drywall and its uses Select the type and thickness of drywall for specific installation Estimate material quantities for a drywall application

		Recognize various types of problems that occur in drywall finishes; identify the causes and correct methods for solving each problem

Benchmarks
Students will be assessed on their *ability* to:

- Perform single layer drywall installation using appropriate fasteners
- Properly finish drywall using proper tools

Academic Connections

ELA Literacy and/or Math Standard (if applicable, Science and/or Social Studies Standard):	**Sample Performance Task Aligned to the Academic Standard(s)**
SL4. Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose and audience. RI1. Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text leaves matters uncertain.	Students will orally explain various types of problems that occur in drywall finishes, identify the causes, and correct methods for solving each problem.
RI4.Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze how an author uses and refines the meaning of a key term or terms over the course of a text.	Students will find and cut proper angles for drywall. Students will calculate surface area of interior and exterior wall to determine the proper amount of sheetrock to be used.

INDICATOR #RC 13: **Understand methods and complete interior finish work**

SUB-INDICATOR 13.1 (Webb Level: 2 Skill/Concept): Understand and demonstrate interior finishing.		
Knowledge (Factual): Millwork Door jams and frames Door schedules	**Understand (Conceptual):** Proper sequence and placement of millwork	**Skills (Application):** Identify different types of moldings List and identify specific items on a typical door schedule

Benchmarks

Students will be assessed on their *ability* to:

- Properly hang a door
- Apply moldings
- Make square and miter cuts using a miter box or a power miter saw

Academic Connections

ELA Literacy and/or Math Standard (if applicable, Science and/or Social Studies Standard):	**Sample Performance Task Aligned to the Academic Standard(s):**
RI1. Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text leaves matters uncertain.	Students will explain the specific items on a typical door schedule.
RI4.Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze how an author uses and refines the meaning of a key term or terms over the course of a tex.t	Students will use measurement to determine proper amount for interior trim. Students will use surface area to determine proper amount of paint, joint compound, and sheetrock tape to be used.

INDICATOR #RC 14: **Understand the cabinet manufacturing process and install**

cabinets

SUB-INDICATOR 14.1 (Webb Level: 2 Skill/Concept): Understand basic cabinet design and installation.

Knowledge (Factual):	**Understand (Conceptual):**	**Skills (Application):**
Wall cabinet Base cabinet Countertop and back splash	The process and procedures for cabinet installation Various types of finishes and cabinet designs.	Identify cabinet components and hardware State the classes and sizes of typical cabinets

Benchmarks
Students will be assessed on their *ability* to:

- Properly install cabinets

Academic Connections

ELA Literacy and/or Math Standard (if applicable, Science and/or Social Studies Standard):	**Sample Performance Task Aligned to the Academic Standard(s):**
RI1. Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text leaves matters uncertain.	Students will orally identify cabinet components and hardware.
RI4.Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze how an author uses and refines the meaning of a key term or terms over the course of a text .	Using the concept of slope, students will be able to construct stair stringers. Students will use Pythagorean Theorem and trigonometry to find lengths of stairwell openings and proper stringer lengths.

INDICATOR #RC 15: **Understand and demonstrate installation of stairs.**

SUB-INDICATOR 15.1 (Webb Level: 2 Skill/Concept): Identify the various types and parts of stairs.
SUB-INDICATOR 15.2 (Webb Level: 2 Skill/Concept): Using appropriate math formula calculate the number and sizes of risers and treads for a stairway.
SUB-INDICATOR 15.3 (Webb Level: 2 Skill/Concept): Layout and cut stringers.

Knowledge (Factual):	**Understand (Conceptual):**	**Skills (Application):**
Riser Step Tread Stringer Nosing	Pitch line Bull nosing Various methods of constructing stairs	Identify various types of stairs Calculate rise and run Identify various terms and definitions relating to a stair

Benchmarks
Students will be assessed on their *ability* to:

- Accurately layout and cut stringer
- Properly install risers and treads

Academic Connections

ELA Literacy and/or Math Standard (if applicable, Science and/or Social Studies Standard):	**Sample Performance Task Aligned to the Academic Standard(s):**
RI1. Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text leaves matters uncertain. RI4.Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze how an author uses and refines the meaning of a key term or terms over the course of a text.	Students will identify various terms related to layout and cut stringers and orally define the definitions related to a stair.

INDICATOR #RC 16: **Study the principles and standards of Basic Residential**

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Electric and Plumbing applications

SUB-INDICATOR 16.1 (Webb Level: 2 Skill/Concept): Understand and demonstrate basic residential electric and plumbing applications.

Knowledge (Factual):	**Understand (Conceptual):**	**Skills (Application):**
Wiring components	Difference between conductors and insulators	Identify electrical hazards
Electrical connections	Basic characteristics of series and parallel circuits	Define voltage and identify the ways in which it can be produced
National Electric Safety Code (NESC)	The importance of properly sizing electrical conductor	Proper use of ohm meter
Plumbing tools	Plumbing hazards and liability factors	Identify wiring and plumbing symbols on construction drawings
Soldering	Importance of following electrical and plumbing codes	Demonstrate safe and proper use of plumbing tools
Plumbing materials	Understand the layout of a residential dwelling to accommodate wiring and plumbing applications	Demonstrate safe and proper soldering techniques
Safety		Measure, cut, and join plastic piping
Uniform plumbing codes (UPC)		

Benchmarks

Students will be assessed on their *ability* to:

- Show proper procedures for soldering which is common in the plumbing industry
- Explain uses of different plumbing materials
- Interpret code for different plumbing situations
- Select methods to properly thread pipe
- Make use of plumbing materials to build a bathroom mock-up
- Illustrate procedures of proper soldering and pipe fitting
- Identify basic codes of electrical wiring
- Interpret proper and improper electrical connections
- Distinguish wire size, capacities, and characteristics
- Classify conductors and other electrical materials
- Manipulate switches, outlets and light fixtures
- Complete construction of electrical project(s)

Academic Connections	
ELA Literacy and/or Math Standard (if applicable, Science and/or Social Studies Standard): RI1. Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text leaves matters uncertain.	**Sample Performance Task Aligned to the Academic Standard(s):** Students will orally explain the uses of different plumbing materials.

INDICATOR #RC 17: **Student will participate in career exploration activities**		
SUB-INDICATOR 17.1 (Webb Level: 2 Skill/Concept): Research career opportunities in the Architecture and Construction fields.		
Knowledge (Factual): Career opportunities in residential construction and architectural and construction fields.	**Understand (Conceptual):** Knowledge of the various careers within A&C. Knowledge of the education required to obtain various careers within A&C.	**Skills (Application):** Various career opportunities will be explored, investigated, examined and researched.
Benchmarks Students will be assessed on their *ability* to: • Explain in detail through written or oral communication their understanding of career opportunities in A&C. • Be 80% proficient in recognizing careers in the A&C field. • Provide an in-depth comparative analysis of personal career and related educational goals with at least one career opportunity in the architecture and construction industry.		
Academic Connections		
ELA Literacy and/or Math Standard (if	**Sample Performance Task Aligned to**	

applicable, Science and/or Social Studies Standard): **A&C Connections to Language Arts** RI1. Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text leaves matters uncertain.	**the Academic Standard(s):** Students will orally or in writing explain their understanding of career opportunities in the A & C profession.

Additional Resources
Please list any resources (e.g., websites, teaching guides, etc.) that would help teachers as they plan to teach these new standards.